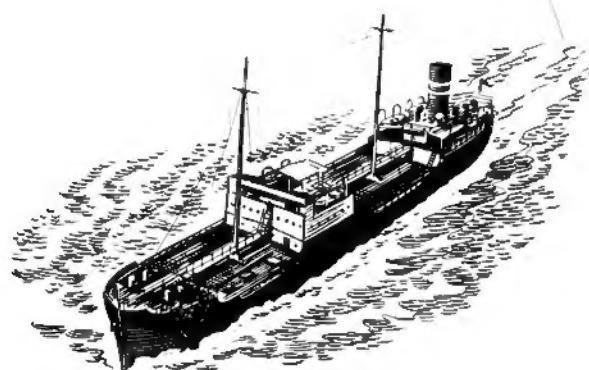


QUESTIONS

The questions that follow are arranged in groups corresponding to the principal divisions of the booklet. No answers are given, as it is believed that a more thorough understanding of the subject can be had if the reader will seek the answers in the preceding pages of the booklet.

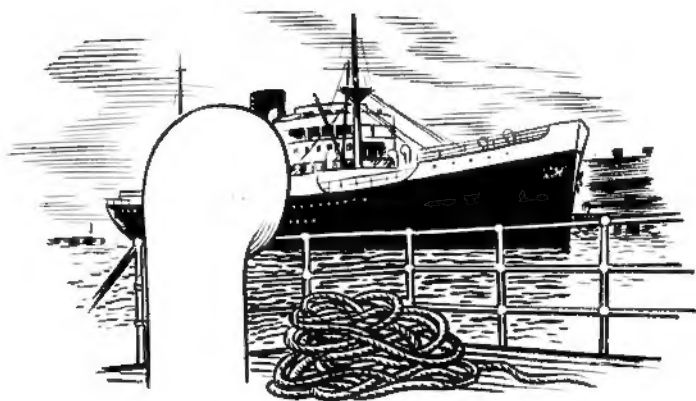
The Gyroscope

1. What is the correct pronunciation of the word "gyroscope"?
2. What is a gyroscope?
3. Name the two fundamental characteristics of the gyroscope and give an example of each.
4. How would you control a hoop if you wished to guide it to the right?
5. Name four rotating bodies that display gyroscopic characteristics, and state why in each case.



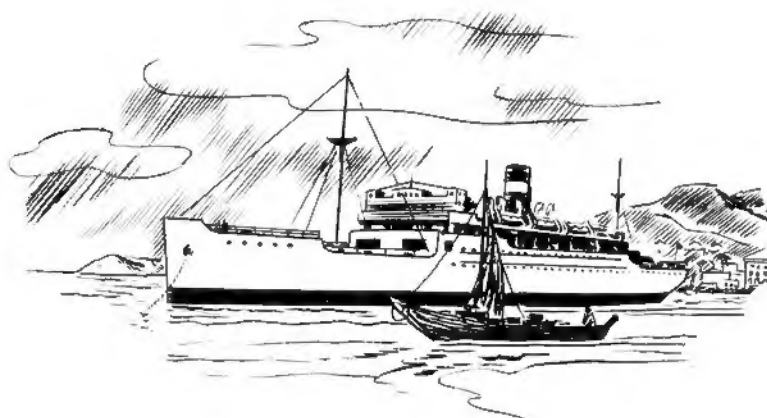
The Gyro-Compass, Principles

1. A *gyroscope* at latitude 60° N is set spinning with its axle horizontal and pointing east and west. What does it do (a) relative to the earth, (b) relative to space?
2. How is a gyroscope controlled to make it seek the north?
3. How is "damping" accomplished?
4. Why not control the gyro with a pendulum?
5. What is the purpose of compensator weights?
6. The rotor of the compass described herein runs counter-clockwise viewed from the south side. What would be the effect upon the compass if the rotor should run in the opposite direction?
7. Where, upon the earth's surface, does the gyro-compass possess its maximum and minimum directive force? Explain.
8. Ship A, at 10° South latitude, steams in a southwesterly direction. How is the gyro axle displaced? Ship B, at 60° North latitude, steams northwest at the same speed. How is the gyro axle displaced? Is the correction greater or less than with ship A?



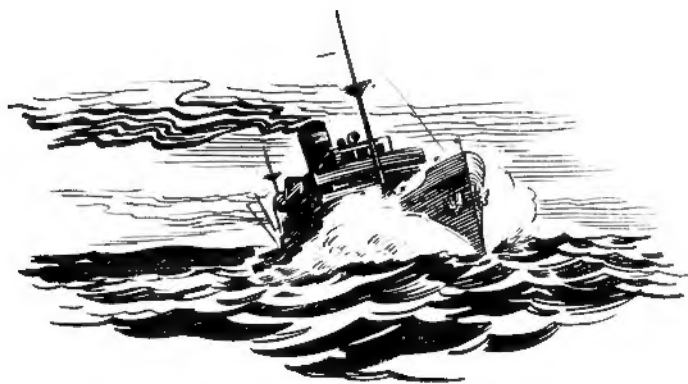
The Gyro-Compass, Construction and Operation

1. Enumerate the principal parts of the gyro-compass and explain the relation between them.
2. A vessel is at the dock at latitude 45° North. You notice that all latitude scales are reading zero. What adjustment would you make to cause the compass to indicate the true heading?
3. What would be the effect on the compass if appreciably more oil were placed in one side of the rotor-case than in the other?
4. What is the purpose of the weights over the mercury containers on the ballistic?
5. The directive force of the gyro is small. How can repeater compasses be operated at the other end of the ship without lost motion, lag or hunt?
6. The master compass card and the card of the steering repeater both read 210° . Does setting the repeater to 215° affect the master compass reading? Explain.
7. Is it necessary to reset the repeaters after each setting of the corrector? Why?



Gyro-Pilot, Construction and Operation

1. Where does the "signal" or control for automatic steering originate?
2. Explain the relation of the four principal units of the gyro-pilot?
3. What is the purpose of the rudder limit switch in the gyro-pilot power unit?
4. What is the purpose of the magnetic clutch?
5. What is the purpose of the differential in the gyro-pilot control unit (shown in Figure 39)?
6. Does the indicating pointer on the top of the gyro-pilot control unit show (a) rudder angle (b) true North (c) the "order" to the rudder?
7. Explain the mechanism of (a) the weather adjustment (b) the rudder adjustment.
8. Loaded ship, you pass from a rough sea into calm water. How would you adjust the gyro-pilot to effect the most accurate steering?



Equipment Operation

1. Except when starting the compass at the dock, why is it necessary to steady the rotor by hand?
2. Why must care be taken never to touch the loosely coiled three-phase supply leads?
3. What is the approximate running temperature of the master compass rotor-case?
4. How often is it necessary to change the speed and latitude correctors?
5. Heavy sea, alarm unit in wheelhouse sounds. What would you do?
6. Gyro-Pilot steering—you wish to change course 3 degrees. Can this be done through the gyro-pilot control unit? How? If you wish to turn the vessel as quickly as possible 180 degrees, why is it advisable to shift the control lever to the "hand" position?
7. What would be the effect on automatic steering if excessive hunting in the repeater system developed? What would you do to remedy this condition?



Further information in regard to the Gyro-Compass and Gyro-Pilot and other marine equipment can be obtained from the Marine Department of the Sperry Gyroscope Company, Inc., in Brooklyn, N. Y. Sales and service representatives are located in —

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